

# DETERMINATION OF BIO CONTENT IN BIOBASED MATERIALS

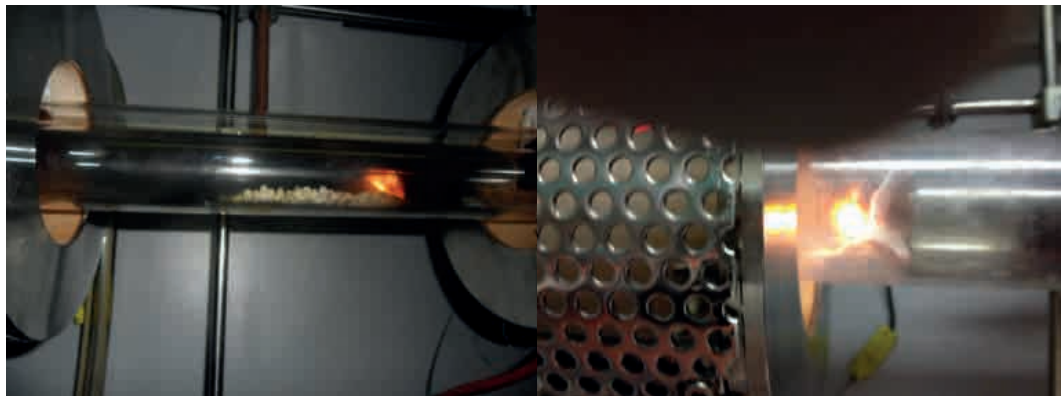
**Innovations and Benefits** - Product promotion, labeling process, export compliance regulations.

**Use** - Analyses of biobased products: bioplastics, biofuels, biocosmetics, agrifood products.

The relative abundances of the three carbon isotopes ( $^{12}\text{C}$ ,  $^{13}\text{C}$  and  $^{14}\text{C}$ ) vary in nature due to processes of biological assimilation of carbon by plants and to chemical-physical processes such as the dissolution of atmospheric carbon dioxide in water. ENEA services provides the determination of  $^{14}\text{C}$  and  $^{13}\text{C}$  content in biobased products.

The analytical technique is based on the extraction of carbon element from the sample by combustion. Based on the ASTM D6866-18, the activity of  $^{14}\text{C}$  is measured to determine the ratio between the "bio" fraction (modern fraction which is enriched in  $^{14}\text{C}$ ) and the fossil fraction (from petroleum which is depleted in  $^{14}\text{C}$ ).  $^{13}\text{C}$  content is measured to determine the origin of the raw materials used for the manufacturing of the biobased products and it provide support information to the measurement of the bio-content.

**Applications and ongoing Activities** - Activities as part of the "Traceability" project by Emilia-Romagna Region within the regional High Technology Network - Traceability Laboratory ([www.tracciabilita.enea.it](http://www.tracciabilita.enea.it)). Collaboration with packaging industries and universities.



Biopolymer combustion in oxygen flow furnace (post-combustion)

## Characteristics:

**CUSTOM** Thanks to its flexibility, the service can be adjusted to different needs and contexts